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## **Important User Advisory Concerning ICM™ 2000 and ICM™ 2000 Plus Units**

November 30, 2001

**To: All Users of the MSA ICM 2000 and ICM 2000 Plus Units**

MSA is currently investigating reports from customers concerning the operation of the ICM 2000 and ICM 2000 Plus Integrated Computer Modules (ICMs). These reports concern the user's inability to reset the PASS pre-alarm with motion, resulting in the unit going into a full alarm status. Less than 2% of the units sold to date have been reported to exhibit this condition. No injuries have been reported. **MSA has notified the National Institute for Occupational Safety and Health (NIOSH) and the Safety Equipment Institute (SEI) of this matter and they support our actions and recommendations as outlined below.**

**It should be noted that the motion sensor used in all MSA ICM units was purposely designed to latch in the full alarm status should any electrical fault occur within the motion sensor or its associated circuitry. Our examination of the units returned to date indicates this has occurred in every case, resulting in a condition that is immediately apparent to the user.**

The motion sensor used in all ICM units utilizes a phosphorus bronze ball which tracks on a flexible circuit within a circular metal housing. The ball moves back and forth across the flexible circuit with user movement. If the user remains stationary, the ball will stop moving and the PASS unit will enter the pre-alarm mode. When the user moves, the resulting motion of the ball tracking along the flexible circuit will reset the pre-alarm and prevent the unit from entering the full alarm mode. If the user does not move the ICM will of course go into the full alarm mode as specified in the NFPA 1982 Standard to which it is certified. This motion sensor assembly is connected to the ICM's main printed circuit board (PCB) with a ribbon cable. The ribbon cable terminates with a crimped connector that is soldered to the PCB.

MSA has examined the units returned from the field and has identified the primary factors that caused the motion sensor to become desensitized. The first issue concerns the connector that is crimped onto the end of the ribbon cable. Examination of this joint on returned units revealed voids between the ribbon cable and the crimped connector on some units. This can result in the unit not resetting from the pre-alarm mode with user motion. We are in the process of implementing an improved crimping method in our manufacturing operation. Our testing indicates this corrects the condition.

The second issue involves the area where the ribbon cable exits the motion sensor's metal housing. It was discovered that the metal housing could possibly chafe the ribbon cable at this exit point, resulting in a loss of electrical continuity. Again, this will result in the ICM entering the full-alarm mode even with user motion. This chaffing possibility will be eliminated with a

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design modification to the metal housing at the point where the ribbon cable exits the housing. The housing now will have an upturned lip eliminating the wire chaffing potential.

The final motion sensor design modification involves increasing the insulation thickness on the ribbon cable itself. This will increase its overall robustness and reduce the possibility of electrical continuity problems.

Our investigation revealed an additional issue with ICM units returned from customers. This condition involves the loosening of the mechanical pressure gauge retaining screws during fire ground use, which can result in the gauge becoming loose and in extreme cases result in the possibility of water entering the ICM unit. Our investigation has revealed that this screw loosening occurs when repeated lateral loads are placed on the pneumatic high-pressure air hose where it enters the ICM case. The data indicates that this has occurred most often in larger cities, where the units tend to be used more frequently. We have corrected this condition by redesigning the gauge retaining screws. These screws now have larger heads to eliminate any side to side play where the screws enter the ICM case assembly. Also, we have lengthened the screws for additional thread engagement into the pressure gauge assembly and added a thread-locking compound to the screws when they are installed in the manufacturing process. Our tests indicate that these improvements result in a pressure gauge assembly that will remain tight in severe and frequent use conditions.

### **User Action**

The ICM units returned to date have fallen into two major categories. Those that had latched into full alarm and those that had loose gauge retention screws. Some returned units exhibited both conditions. While the motion sensor was purposely designed to fault in the full alarm or “safe” condition, several customers have expressed concern that users might take the battery out of the unit to silence the alarm or might become desensitized to the alarm itself.

- **It is imperative that ICMs that cannot be reset from the pre-alarm mode with normal user motion be immediately removed from service.**
- **Do not use an SCBA with the battery removed from the ICM.**
- **Do not ignore any full alarm condition. All full alarm signals must be acted upon, following your fire department’s Standard Operating Procedures.**
- **Any ICM that performs in a manner that is inconsistent with normal operation as detailed in the MSA ICM User Instructions, must be immediately removed from service and returned to MSA for repair or replacement.**

**All repairs or replacements will be done under the conditions of MSA’s ICM warranty.**

We apologize for any inconvenience this notice may cause. However, MSA is committed to product excellence and we trust the action we have taken regarding these ICM issues will help you to continue to use MSA products safely. If you have any questions, please feel free to contact MSA Customer Service toll-free at 1-877-MSA-3473.

Very truly yours,

A handwritten signature in black ink, appearing to read "Charles J. Seibel, Jr.", with a stylized flourish at the end.

Charles J. Seibel, Jr.  
Manager of Product Safety